

THE CONTAMINATION OF MILK.

It has been very fully established by the articles on the subject published in our columns, the conclusions of which have been confirmed on all hands, that a great deal of the milk consumed in this country is produced under conditions very far from satisfactory. Although only a short period, measured by hours, elapses between the actual production of milk and its consumption, it is open to contamination from several different sources, and it is to a great extent the variety of these sources, and the difficulty of fixing upon the particular source, that has added so much to the perplexities of those whose business it is to improve the conditions of the milk supply. Those perplexities will be very much lessened by a perusal of the extremely valuable report on an investigation as to the contamination of milk, which has just been issued by a joint committee appointed two years ago by the councils of the county boroughs of Bradford, Hull, Leeds, Rotherham, and Sheffield, and the administrative counties of the East and West Ridings of Yorkshire.* These authorities decided at a conference held in July, 1906, that it was desirable to have an investigation made into the conditions of the milk supply of the East and West Ridings with a view to ascertaining definitely the extent, if any, to which such supply was contaminated, the cause or sources, and the nature of such contamination. A laboratory was provided by the Yorkshire Council for agricultural education at the council's farm at Garforth, and Dr. Thomas Orr, B.Sc., was appointed to make a series of examinations, extending over twelve months, of specimens of milk secured for him under test conditions by officers of the authorities represented on the joint committee. The great value of these examinations will be appreciated when it is stated that four sets of samples were taken for examination—at the cowshed, the railway station, the street or dairy, and at the consumer's house, and the same milk was sampled throughout, no admixture being allowed with that from which the first sample was taken. The work was carried out by two inspectors from each district, who were thoroughly instructed in the proper method of sampling with bacteriological care. They were both present at the taking of the samples, and one acted as a check on the other.

Dr. Orr decided that he would carry out his investigations on the following lines:

1. To estimate the total number of organisms per cubic centimetre in the samples taken at various points of transit, and in various control samples, in order to determine the number of organisms added at different stages.
2. To estimate the amount of sediment in milk taken at the cowshed, and at the point where it is supplied to the consumer, in order to ascertain if any increase occurs in the amount during transit.
3. To estimate the number of *Bacilli enteritidis sporogenes* (Klein) at each stage of transit, in order to note if these organisms are added at any point.
4. To estimate the number of glucose-fermenting bacteria and streptococci at each stage, in order to determine the increase due to contamination during transit.
5. To identify the various species of glucose-fermenting bacteria in order to determine if any new species are added at various points of transit.

The results of the investigations made may be said to be briefly as follows:

1. Of the total organisms in the milk used by the consumer, the greatest number are contributed by the farmer. During railway transit, at the retailer's premises, and in the consumer's house smaller amounts are added, the amount in each instance being apparently the same.
2. The sediment or dirt gains entrance to the milk chiefly at the cowshed. In 86.8 per cent. of the samples examined there was no increase in the sediment when sold by the retailer, and in 68.8 per cent. there was a decrease.
3. The farmer was responsible for the *Bacillus enteritidis sporogenes* (Klein) in the milk consumed in 66.6 per cent. of the samples in which it was present. The bacilli were added by the retailer or by the consumer in 11.1 per cent., and the source was doubtful in 22.2 per cent.

4. Of the glucose-fermenting or intestinal organisms and the streptococci, by far the greatest number are added at the farm. The retailer adds a certain number, the consumer none.

5. The chief primary source of the glucose-fermenting organisms is the manure at the cowshed, though they are further propagated in the milk.

This last conclusion of Dr. Orr does not agree with that arrived at by Houston, who has expressed the opinion that the numerous *Bacilli coli* found in milk are not derived directly from fresh excrement, but from some other source of contamination, such as dust.

Although we have stated in few words the problems which Dr. Orr set himself to solve and the solutions of those problems, it must not be supposed that the task was an easy one. The record of the work accomplished which is contained in the report is a monument of painstaking research. The authorities who suggested the investigation are to be congratulated not only upon its initiation, but upon the admirable manner in which it has been carried out.

Dr. Collingridge, Medical Officer of Health for the City of London, in a further report upon the investigations into the condition of the milk arriving in London from the country, lately presented to the Sanitary Committee of the Corporation, summarizes the results of the four years 1904-7 in the following table:

	1904. Per cent.	1905. Per cent.	1906. Per cent.	1907. Per cent.
Fairly clean and pure ...	48.7	68.2	80	54.2
Unclean ...	43.6	22.7	12	37.5
Tuberculous ...	7.7	9.1	8	8.3

In commenting upon the figures and facts for last year, which are fully set out in the report, he says that it is apparent that little care is taken at the source to safeguard the milk supply, the farmer in the majority of cases taking practically no precautions in this direction until he is forced to do so. It is satisfactory to learn that Dr. Collingridge's experience is to the effect that there is no real difficulty in getting the milk supply efficiently dealt with at the actual source—the farm—by the local authority. The urban authority can determine the condition of the milk supply to its district, and, if this is found unsatisfactory, can furnish a report to the local authority in which the farm is situated, and also to the Board of Agriculture and Fisheries. Dr. Collingridge suggests that this Board should be authorized to take action in any cases of default, and charge the expenses incurred against the defaulting local authority. He points out that there is no foundation for the impression that railway companies object to churns being locked, and strongly condemns the common practice of mixing milk on railway station platforms.

LITERARY NOTES.

M. FELIX ALCAN has just published a work entitled *Littérature et Folie: Étude Anato-mo-pathologique du génie littéraire*, by Dr. P. Videnel, *Chef de Clinique* in the Faculty of Medicine of Toulouse. Professor Rémond contributes a preface.

The first fasciculus of the *Bulletin de la Société d'Égypte* recently issued at Cairo contains a paper on the beetles found in Egyptian mummies.

Our attention has been called by Dr. H. Drinkwater, of Wrexham, to an obvious misprint in a paragraph relative to the erection of a statue of Michael Servetus, which appeared in the *JOURNAL* of July 11th. It was there stated that Servetus lived at Vienna. This should of course have been "Vienne," a French city on the Rhône where an ecumenical council was held in the fourteenth century. "Vienne" is the ancient Vienna, the capital of the Allobroges. We take the opportunity of adding a few facts to the brief sketch of the life of Servetus which was given in the paragraph referred to. He was physician to the Archbishop of Vienne for twelve years. Though he outwardly conformed to the Catholic creed, he was in his heart a Protestant. Several years before he was burnt he

* Copies can be obtained from the Clerk of the East Riding County Council, Beverley, price 2s. 6d.

sent a manuscript of his theological tracts to Calvin at Geneva, from whom he could not recover them. That he had a premonition of the fate that awaited him is shown by a passage in a letter to a friend, in which, after mentioning that he could not get his manuscripts back, he says "mihi ob eam rem moriendum esse certo scio." He was first put on his trial for heresy before the Grand Inquisitor of Lyons, but escaped from prison by the connivance of his gaolers. He passed literally from the frying pan into the fire, for fleeing to Geneva he was almost immediately arrested and put upon his trial, the proceedings lasting from August 14th to October 26th, when he was sentenced "*estre bruslé tout vif*." The sentence was carried out on the following day. In the meantime he had been sentenced by the civil tribunal of Vienne to be fined and burned alive, but the sentence of the ecclesiastical tribunal of Vienne was delayed till December 23rd. Although, therefore, the Catholics would have burned him if they had had him in their power, the discredit of his judicial murder lies at the door of the Geneva Reformers. It is an interesting circumstance that Servet succeeded Andreas Vesalius as Demonstrator of Anatomy under Günther, who speaks in the highest terms of his general culture, and pays a special tribute to his skill in dissection. He seems, however, to have had a fair share of the combative nature of scientific genius, for in 1538 he had to defend an action brought against him by the Medical Faculty of Paris for lecturing on astrology! A man who got into trouble alike with Catholics, Protestants, and physicians, must have been, as Carlyle's mother said of her famous son, "gey ill to live wi'."

In a thesis presented to the University of Paris for the degree of Doctor of Medicine on June 4th, 1908, Dr. Georges Billaudet deals with the question of overcrowding in the Paris hospitals. In a historical introduction he says that in the reign of Louis XI the Paris Hôtel-Dieu contained five wards. One of these was reserved for convalescents; another for cases of wounds requiring the application of the surgeon's art; a third for cases of serious illness and old people who lay in low beds so that they could be more conveniently moved; a fourth, larger than the others, for sick women, no distinction being made between different kinds of disease; a fifth for poor women and for those about to be confined. Already in the reign of Francis I complaints were made of overcrowding, which was said to be the cause of *ordures et putrefactions*, unwholesome not only for the sick but for those who ministered to them. The Hôtel-Dieu is said by the author to have had 800 to 900 beds at the beginning; in 1651 there were 1,800, in 1663 the number had risen to 2,500, and in 1765 to 3,000. Yet the accommodation was insufficient, and Dr. Billaudet estimates that there should have been 4,800 beds. In 1788, after the partial destruction of the Hôtel-Dieu by fire, Tenon, Professor in the Royal College of Surgery, was asked by the Académie des Sciences to draw up a scheme to replace the building, which at that time contained 25 wards, by four new hospitals. He presented several reports which show the lamentably insanitary state of the Hôtel-Dieu, and proposed a model plan which he carried out till 1854. The wards were for the most part very large. One of them, divided by an incomplete partition, had four rows of beds, 130 large and 38 small, and could accommodate 818 patients, at the rate of 6 patients to each of the larger beds. "If more are admitted," says Tenon, "they are placed on beds swung on ropes in the gangways in the middle, and even on the tops of the beds." The author gives an interesting account of the growth of the idea of isolation of contagious affections and of the building of new hospitals. These, he says, are still overcrowded; and if the state of things is no longer such as existed in the old days, there is still, according to him, great room for enlargement and improvement. The thesis should be read by all interested in the problem of providing for the sick poor of large cities.

Dr. H. David, in a thesis presented for the doctor's degree at the University of Paris on June 25th, 1908, gives an account of the plague at Angers. The first invasion of which there is record occurred in the second half of the fifth century. It caused the Saxons and the Franks who were besieging the town to beat a hasty retreat. In 575 the town was devastated by what Gregory of Tours calls "a universal plague." In the fourteenth century the Black

Death visited the place and prevailed for eleven months; the mortality in Angers, however, was small in comparison with that in other places. In 1362 there was another outbreak. The next record relates to 1407 and during the greater part of the fifteenth century Angers continued to be scourged by plague. The hospital was closed to contagious diseases and the sick died in the streets. The dead were buried in lonely places outside the town, and even relations were forbidden to visit the graves. In 1472 the kiss of peace was replaced at high mass by an instrument which served as a medium for the transmission of the kiss. In 1486 there was performed at Angers a "mystery play" of the Passion by a physician, "the very eloquent and scientific doctor, Master Jehan Michel." In 1498, when Louis XII and his queen wished to visit Angers, a strict inquiry was made as to the sanitary condition of the town; for what reason we cannot conjecture this inquiry was not entrusted to physicians, but to the parish priests of the town, assisted by two pharmacists. In 1514 there was another terrible visitation, and in the following year the town issued an order for the removal of the *immondaitez pouvant causer peste*. The epidemic recurred in 1518, and again in 1519; this outbreak is referred to by Rabelais. Again, in 1521, the barbers of the town were called together to give information whether they had bled persons suffering from the plague. The disease was in the town in 1530, and again in 1532, and in December, 1551, the chief provost proposed various measures for the prevention of contagion by "pestilential air." Then came the wars of religion, bringing famine and disease in their train, and plague is heard of as causing great mortality in 1562. The scourge raged again in 1568, and in 1583 a hospital for the plague-stricken was erected. The provost with his four assistants known as "crows" perambulated the streets every day, ringing a little bell, to give notice to the inhabitants; their business was to carry the bodies of the dead to their last resting place, and the sick in chairs to the Hôtel-Dieu. They had also to see to the cleanliness of the town. In 1533 and 1584 more than 9,000 persons died of plague in Angers; on a single day, August 21st, 1584, seventeen parish priests of the diocese died. Other epidemics occurred in 1598, 1600, 1603, 1605, 1606, and 1607. In 1625 a severe epidemic almost paralysed civic life; the bodies of the newly-buried dead were devoured by dogs and wolves. The epidemic lasted till 1627, and of 8,000 sick, 6,000 died. Small outbreaks continued to occur in the following years till 1646. In 1703, there was an outbreak. In 1720 the inhabitants of Angers were greatly scared by the great epidemic at Marseilles, but the precautions taken, helped by good fortune, kept them safe. On the cessation of the plague at Marseilles a *Te Deum* was sung, and there was a display of fireworks on February 28th, 1723. This is the last time the plague is mentioned in the official registers of the town.

THE NEW BUILDINGS OF THE ASSOCIATION.

For the benefit of such of our readers as may not have had an opportunity of seeing the new building of the British Medical Association, we publish this week reproductions of the two façades, that looking towards the Strand and the one looking towards Agar Street. The building is, of course, unfinished, and the lower part is covered with somewhat unsightly hoardings; but the statues about which such a fuss has been made are plainly visible. They are reproduced in the fullest size allowed by our page, so that we may not expose ourselves to a charge of hiding or extenuating anything. A full description of the statues was given by the artist, Mr. Jacob Epstein, in the BRITISH MEDICAL JOURNAL of July 4th, p. 40, and we need only recapitulate here his explanation of the symbolism. The first figure starting on the Strand side represents Primal Energy, making a gesture as of blowing the breath of life into the atom. Next comes a figure representing Matter, intended to show form and life coming out of chaos. The other statues on the Strand front symbolize Chemical Research and Academic Research; Hygeia is there with her traditional emblems, the cup and the serpent. On the Agar Street front is a figure holding a winged skull, denoting the brain, the organ of Thought. Next is an old woman holding